IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A method for optimizing machining conditions of an electric discharge machine that a work to be machined is subjected to electric discharge machining by use of a machining liquid, the method comprising: ~~a discharge voltage detecting step of~~

detecting an average discharge voltage in a specified period of time at the time of electric discharge machining; ~~a discharge current computing step of~~

determining a discharge current that makes a discharge voltage detected by the ~~discharge voltage~~ detecting ~~step~~ equal to a discharge voltage ~~when an~~ when a new machining liquid is ~~used from the~~ used, and the discharge current is determined based on relationships between a discharge voltage when the new machining liquid is used, ~~and~~ a volume resistivity of the new machining liquid, and a discharge current of the new machining liquid; and ~~an optimum machining condition computing step of~~

determining discharging time, non-operating time, and a servo reference voltage, which depend ~~on a~~ on the discharge current determined by the determining the discharge ~~current computing step,~~ current, from ~~the~~ relationships between [[a]] the discharge current, discharging time, non-operating time, and a servo reference voltage that establish optimum machining conditions.

Claim 2 (Currently Amended): The method for optimizing machining conditions of an electric discharge machine according to claim 1, wherein the ~~optimum machining condition computing step computes~~ optimum machining conditions are computed from ~~the following~~ relational equations, the relational equations including:

$ON = A \times Ip - [[B]] B$,

$OFF = C \times EXP(D \times ~~ON)~~ ON)$, and

$SV = E \times ON^{\wedge} - F = E / ON^{F}$,

~~where~~ wherein the ON is the discharging time, the OFF is the non-operating time, the SV is [[a]] the servo reference voltage, the Ip is [[a]] the discharge current, and ~~A to F~~ the A, the B, the C, the D, the E, and the F are coefficients and ~~their~~ ranges of application of the coefficients are A = 7 to 10, B = 1.0 to 3.5, C = 25 to 35, D = 0.01 to 0.02, E = 200 to 250, and F = 0.2 [[t 0.4;]] to 0.4, and

wherein the symbol ^ represents exponential power.

Claim 3 (Currently Amended): An electric discharge ~~machine~~ machine, comprising:

an electrode for machining, for performing electric discharge machining to a workpiece ~~to be machined that is~~ held in a machining liquid;

a servo for controlling a gap between ~~this~~ the electrode for machining and the ~~workpiece to be machined,~~ workpiece, and for applying a discharge voltage to the electrode for machining;

a servo control unit for sending a servo reference voltage to ~~this~~ the servo;

a discharge voltage detecting ~~unit,~~ unit connected between the electrode for machining and the ~~workpiece to be machined,~~ workpiece, for detecting [[a]] the discharge voltage at ~~the~~ a time of electric discharge ~~machining:~~ machining;

a machining condition database storing unit for storing [[a]] the discharge voltage and a discharge current when a new machining liquid is used, a volume resistivity of the new machining liquid, and [[a]] relational ~~equation~~ equations with [[a]] the discharge current, a discharge time, a non-operating time, and [[a]] the servo reference voltage that establish an optimum machining condition; and

an optimum machining condition computing unit, connected to the discharge voltage detecting unit and the machining condition database storing unit, for computing [[a]] the discharge current, [[a]] the discharge time, [[a]] the non-operating time and [[a]] the servo reference voltage when [[a]] the discharge voltage detected by the discharge voltage detecting unit at the time of electric discharge machining coincides with [[a]] the discharge voltage in the case of using the new machining liquid by the relational ~~equation,~~ equations, and for sending the discharge current, the discharge time, the non-operating time and the servo reference voltage to the servo control unit.

Claim 4 (Currently Amended): The electric discharge machine according to claim 3, wherein the relational equations with the discharge current, the discharge time, the non-operating time, and the servo reference voltage that establish ~~an~~ the optimum machining condition ~~are as follows~~ include:

$ON = A \times Ip$ - [[B]] B,

$OFF = C \times EXP(D \times$ ~~ON)~~ ON), and

$SV = E \times ON^{\wedge} - F = E / ON^{F}$,

~~where~~ wherein the ON is the discharging time, the OFF is the non-operating time, the SV is [[a]] the servo reference voltage, the Ip is [[a]] the discharge current, and ~~A to F~~ the A, the B, the C, the D, the E, and the F are coefficients and ~~their~~ ranges of application of the

coefficients are A = 7 to 10, B = 1.0 to 3.5, C = 25 to 35, D = 0.01 to 0.02, E = 200 to 250,

and F = 0.2 to [[0.4;]] 0.4, and [[a]]

wherein the symbol ^ represents exponential power.